

WHAT IS CLAIMED IS:

1. A signal processing method comprising:
receiving a first signal for wireless communication;
obtaining an approximate function of pulse shaping in the first signal;
separating the approximate function of pulse shaping from the first signal to obtain a second signal; and
processing the second signal to obtain a user signal.
2. The method of claim 1, further comprising:
conducting a single-user detection; and
obtaining an amplitude estimate and a symbol delay for a user in a frame.
3. The method of claim 1, wherein the second signal has insignificant or no pulse shaping effects.
4. The method of claim 1, wherein separating the approximate function of pulse shaping from the first signal comprises applying an equalization.
5. The method of claim 1, wherein separating the approximate function of pulse shaping from the first signal comprises applying a decision feedback equalization.

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6. The method of claim 1, wherein separating the approximate function of pulse shaping from the first signal comprises applying at least one order of perturbation to adjust the approximate function of pulse shaping.

7. The method of claim 1, wherein separating the approximate function of pulse shaping from the first signal comprises:

applying at least two equalizations; and

repetitively applying at least one order of perturbation to adjust the approximate function of pulse shaping.

8. The method of claim 1, wherein separating the approximate function of pulse shaping from the first signal comprises separating an approximately known function of pulse shaping from a received function of a time-varying channel function.

9. A signal processing method comprising:

receiving a first signal for wireless communication;

obtaining an approximate of a non-channel function in the first signal;

separating the approximate of the non-channel function from the first signal to obtain a second signal that includes a time-varying channel function; and

processing the second signal to obtain a user signal.

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10. The method of claim 9, wherein the non-channel function comprises a function selected from a linear and continuous transformation function, a pulse-shaping function, and a low-pass filtering.
11. The method of claim 9, further comprising:
 - conducting a single-user detection; and
 - obtaining an amplitude estimate and a symbol delay for a user in a frame to obtain the approximate of the non-channel function.
12. The method of claim 9, wherein the second signal has insignificant or no non-channel functions.
13. The method of claim 9, wherein separating the approximate of the non-channel function from the first signal comprises applying an equalization.
14. The method of claim 9, wherein separating the approximate of the non-channel function from the first signal comprises applying a decision feedback equalization.
15. The method of claim 9, wherein separating the approximate of the non-channel function from the first signal comprises applying at least one order of perturbation to adjust the approximate of the non-channel function.

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16. The method of claim 9, wherein separating the approximate of the non-channel function from the first signal comprises separating an approximately known non-channel function from a received function of a time-varying channel function.

17. The method of claim 9, wherein separating the approximate of the non-channel function from the first signal comprises:

applying at least two equalizations; and

repetitively applying at least one order of perturbation to adjust the approximate of the non-channel function.

18. A signal processing system, comprising:

a receiver for receiving a first signal for wireless communication;

a tracking device for obtaining an amplitude estimate and a symbol delay for a user;

an approximating device for providing an approximate of a non-channel function in the first signal; and

a signal-separating device for separating the approximate of the non-channel function from the first signal to obtain a second signal that includes a time-varying channel function.

19. The method of claim 18, wherein the non-channel function comprises a function selected from a linear and continuous transformation function, a pulse-shaping function, and a low-pass filtering.

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20. The method of claim 18, wherein separating the approximate of non-channel function from the first signal comprises at least one of the following process:

applying at least one equalization; and

applying at least one order of perturbation to adjust the approximate of the non-channel function.

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